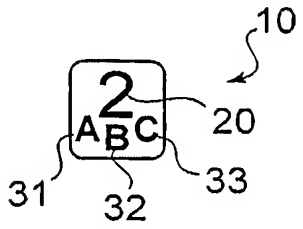
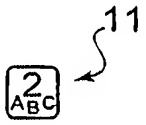
Micro Cellphone Keybutton Tops (or Keycaps)



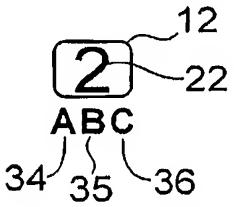
Alphabetic legend ON keycap (enlarged from actual size)

FIG. 1A



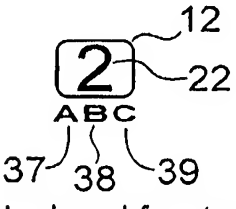
Actual size keycap

FIG. 1B



Number on keybutton top plus alphabetic legend on stretched material

FIG. 1C



When stretched material relaxed for storage, legend shrinks.
But, keybutton top stays same size.

FIG. 1D

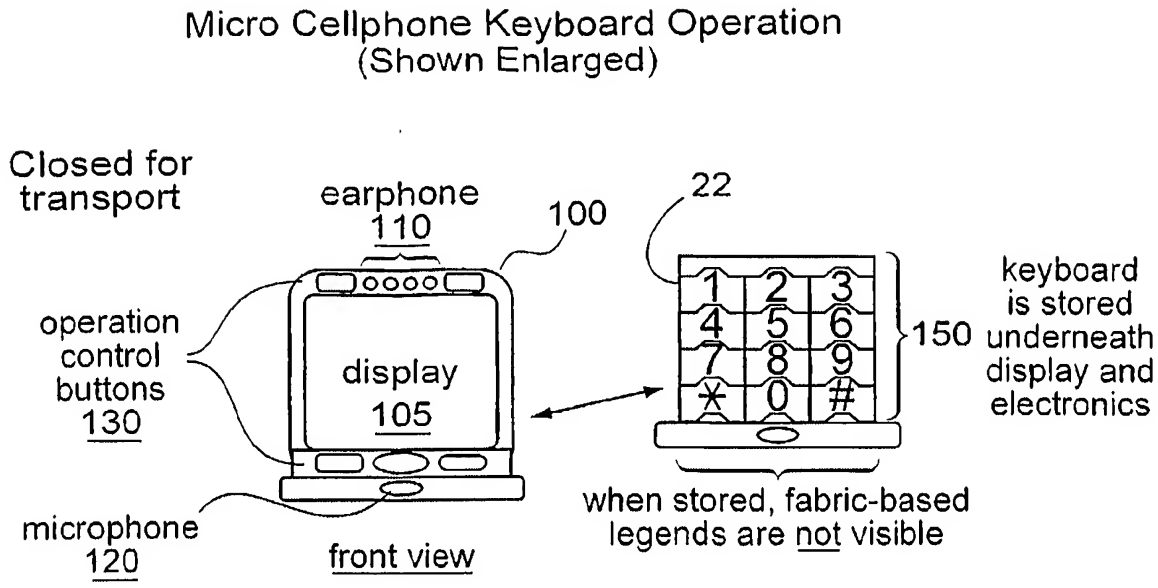

Micro Cellphone Keyboard Operation
(Shown Enlarged)
Closed for transport
earphone 110
100
22
operation control buttons 130
display 105
1 2 3
4 5 6
7 8 9
* 0 #
150
keyboard is stored underneath display and electronics
microphone 120
front view
when stored, fabric-based legends are not visible

FIG. 2A

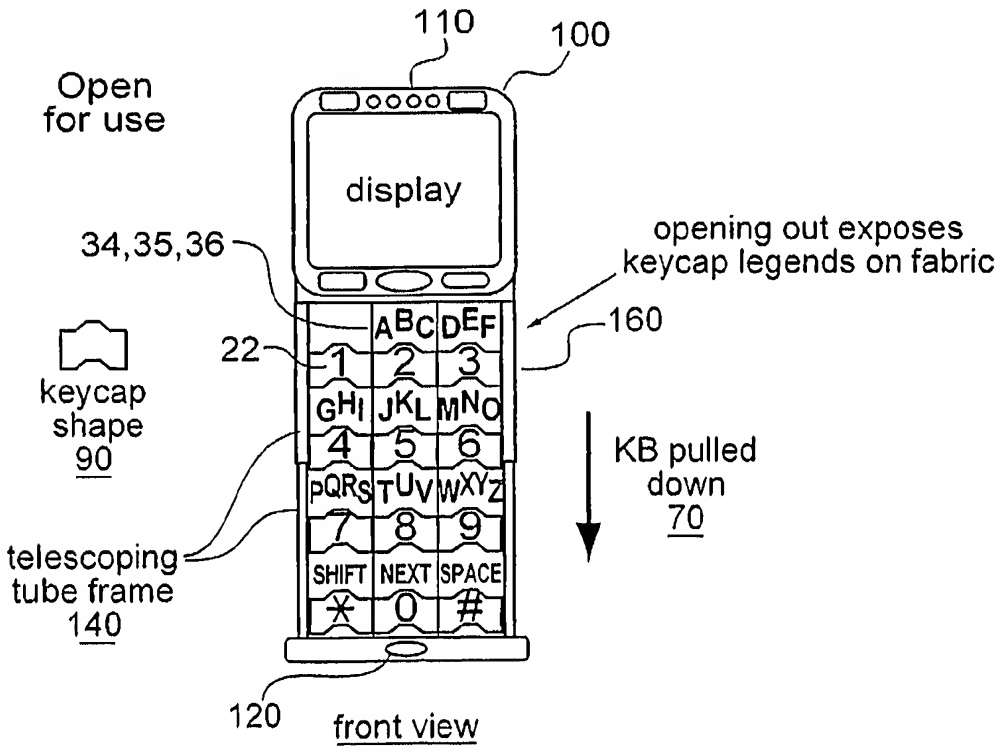
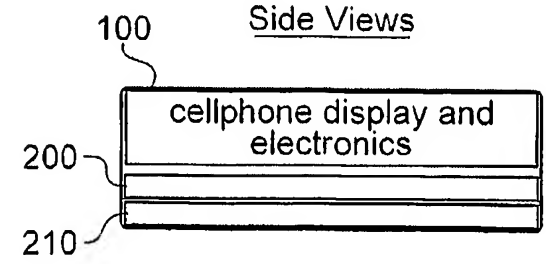

110
100
Open for use
display
34,35,36
opening out exposes keycap legends on fabric
160
22
keycap shape 90
ABC DEF
1 2 3
GHI JKL MNO
4 5 6
PQRS TUV WXYZ
7 8 9
SHIFT NEXT SPACE
* 0 #
KB pulled down 70
telescoping tube frame 140
120
front view

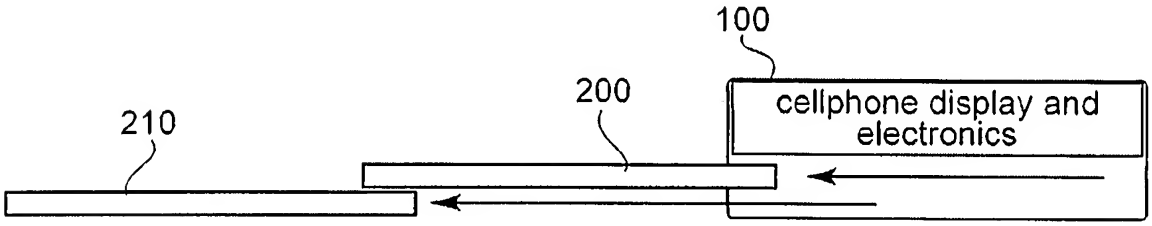
FIG. 2B

Two drawer Keyboard for micro cellphone



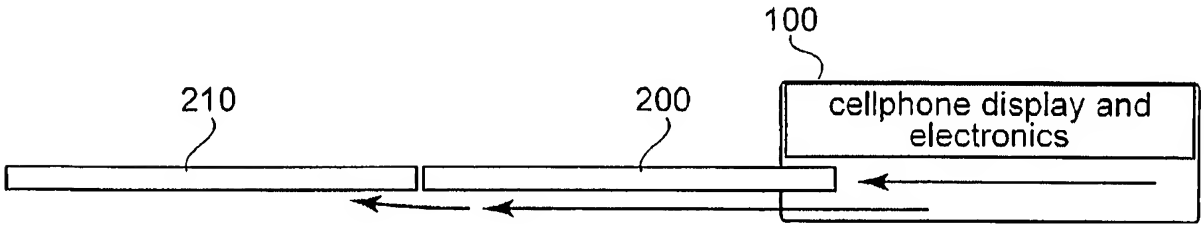
keyboard stored

FIG. 3A



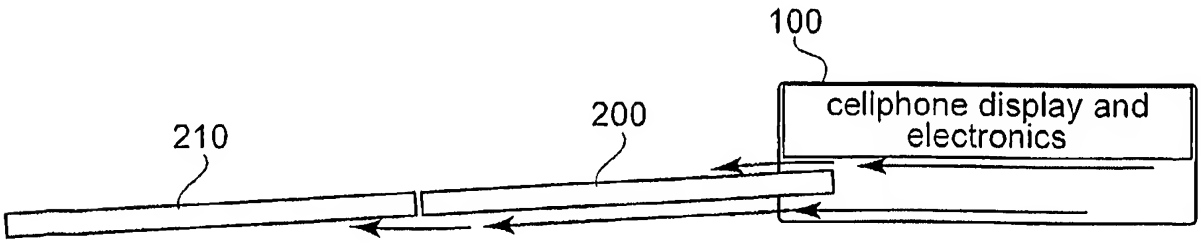
keyboard open (stairstep)

FIG. 3B



keyboard open (flat and level)

FIG. 3C



keyboard open (flat and angled)

FIG. 3D

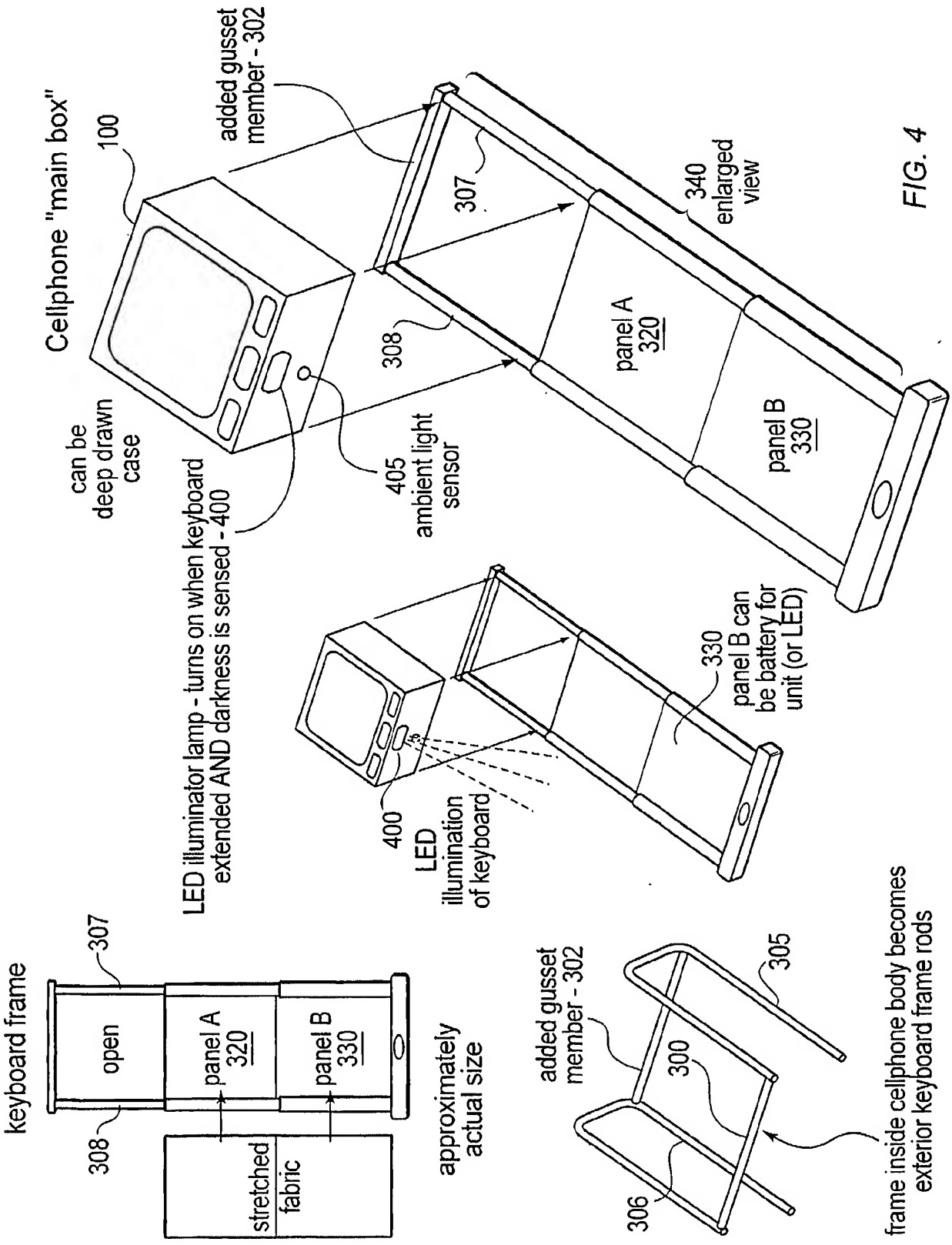

Cellphone "main box"
100
added gusset member - 302
307
340 enlarged view
308
panel A 320
panel B 330
can be deep drawn case
LED illuminator lamp - turns on when keyboard extended AND darkness is sensed - 400
405 ambient light sensor
330 panel B can be battery for unit (or LED)
400 LED illumination of keyboard
keyboard frame
307
open
panel A 320
panel B 330
308
stretched fabric
approximately actual size
added gusset member - 302
305
300
306
frame inside cellphone body becomes exterior keyboard frame rods

FIG. 4

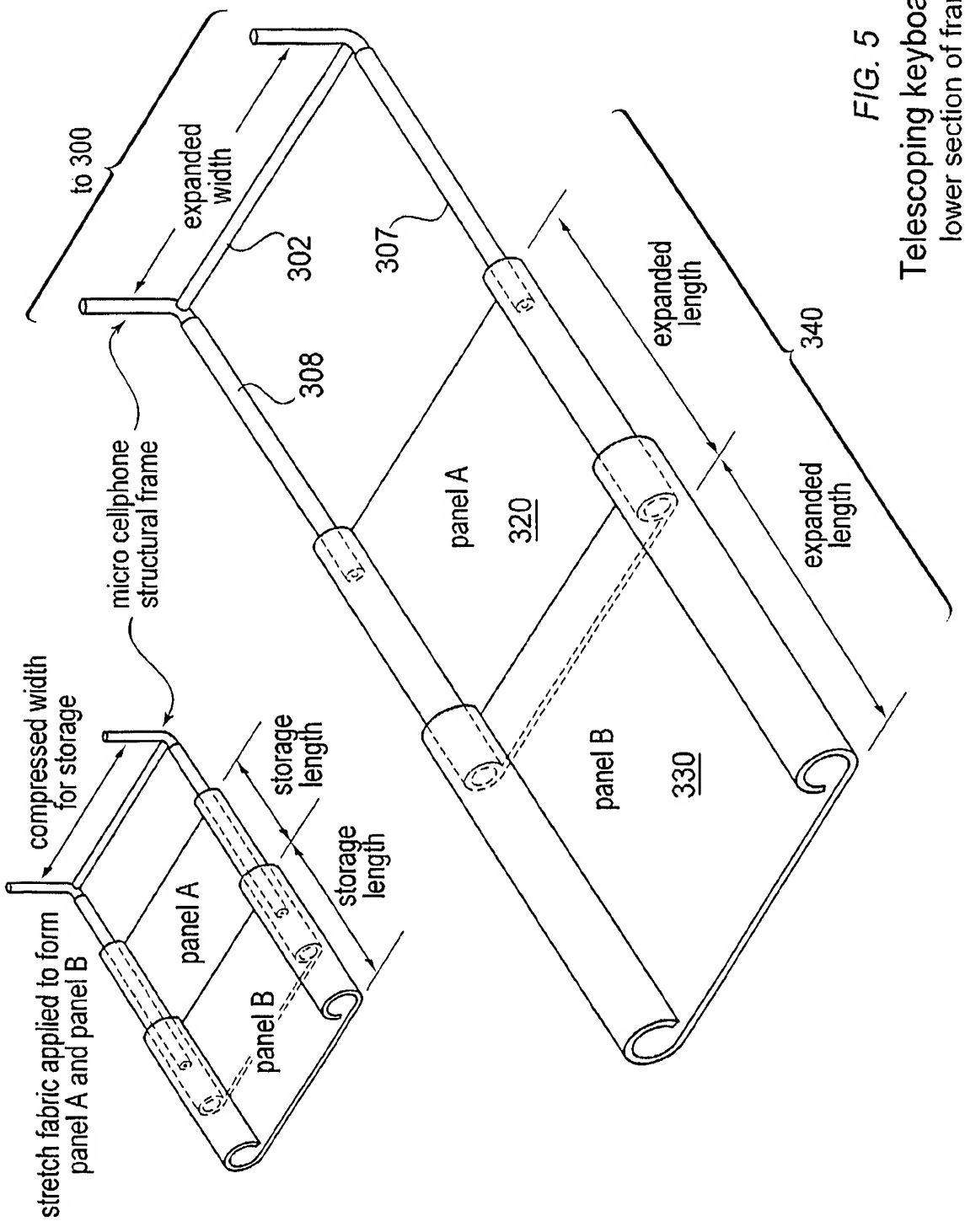


FIG. 5
Telescoping keyboard frame
lower section of frame unit

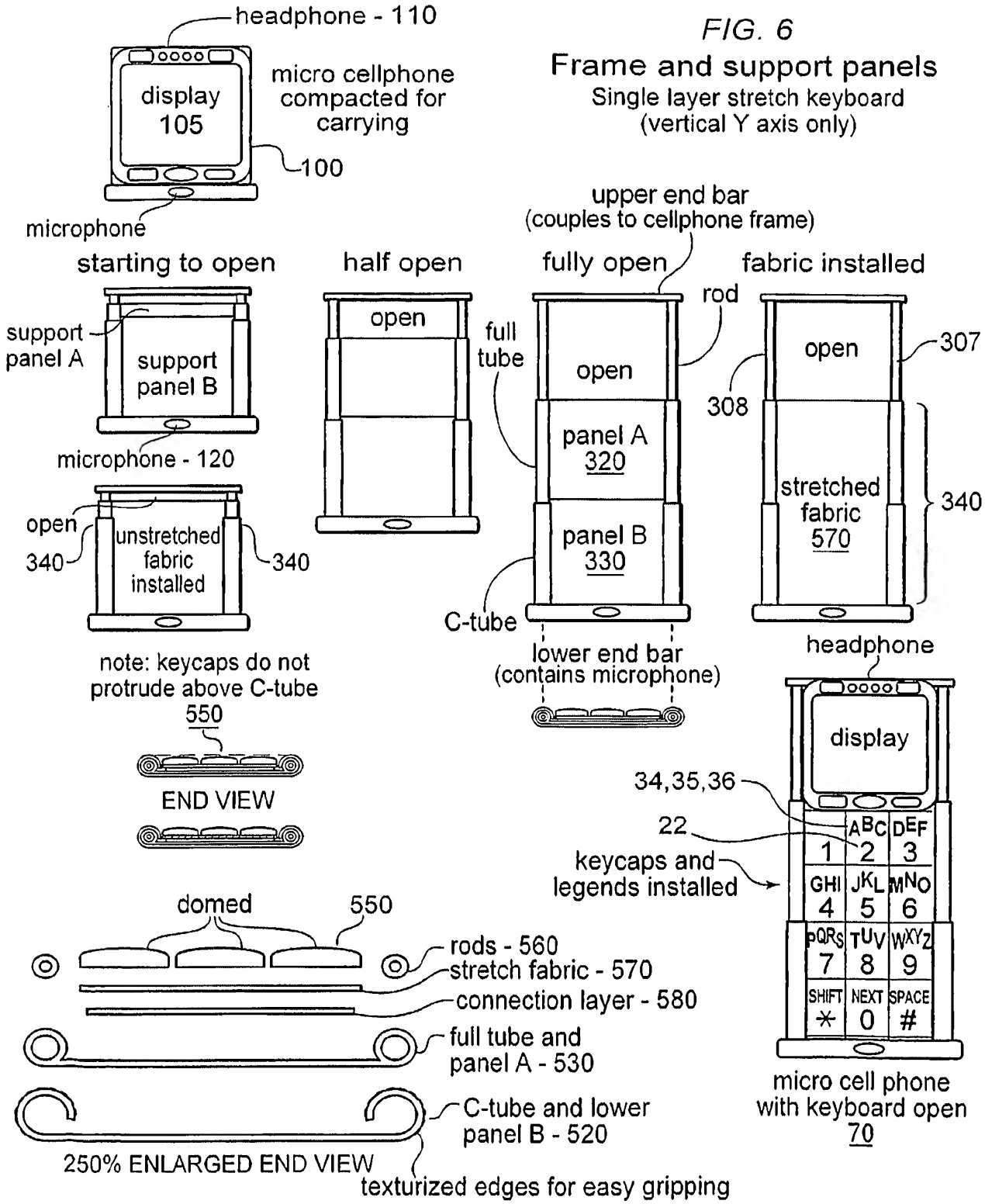
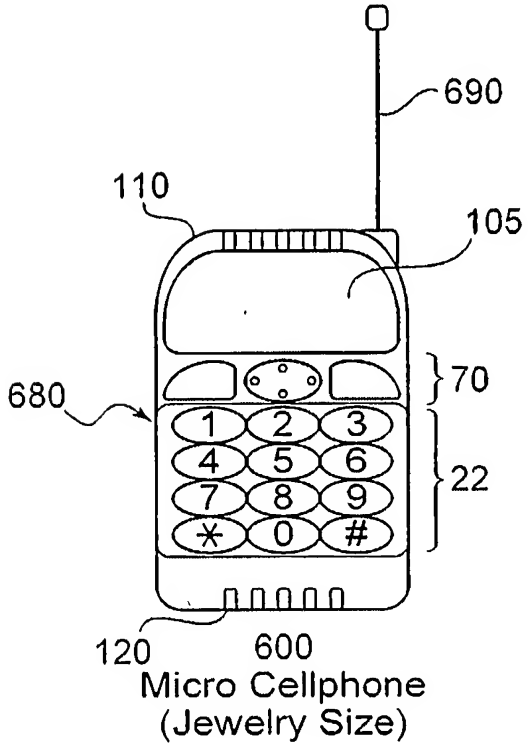


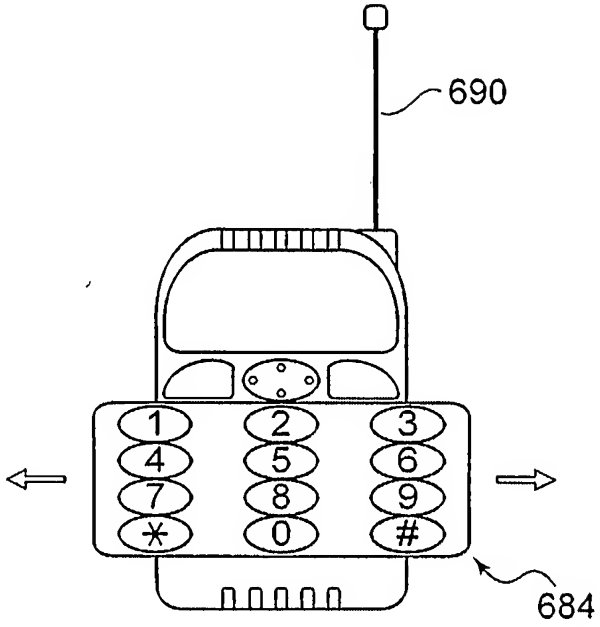
FIG. 6
Frame and support panels
Single layer stretch keyboard
(vertical Y axis only)
headphone - 110
display 105
micro cellphone compacted for carrying
100
microphone
starting to open
half open
fully open
fabric installed
upper end bar
(couples to cellphone frame)
rod
support panel A
support panel B
microphone - 120
open
full tube
open
panel A 320
panel B 330
C-tube
lower end bar
(contains microphone)
open
307
308
stretched fabric 570
340
open
340
unstretched fabric installed
340
note: keycaps do not protrude above C-tube
550
END VIEW
headphone
display
34,35,36
22
keycaps and legends installed
domed
550
rods - 560
stretch fabric - 570
connection layer - 580
full tube and panel A - 530
C-tube and lower panel B - 520
250% ENLARGED END VIEW
texturized edges for easy gripping
micro cell phone with keyboard open
70

Stretch keyboard for cellphone
(greatly enlarged over actual size)



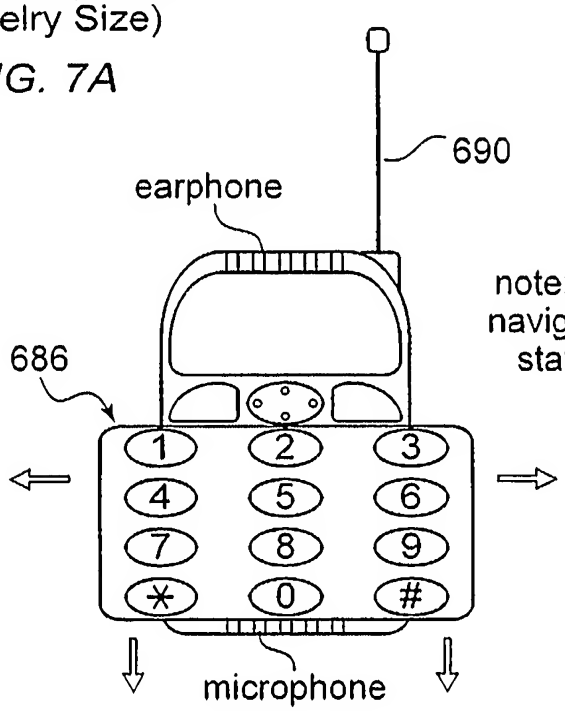
Micro Cellphone
(Jewelry Size)

FIG. 7A



horizontal stretch only

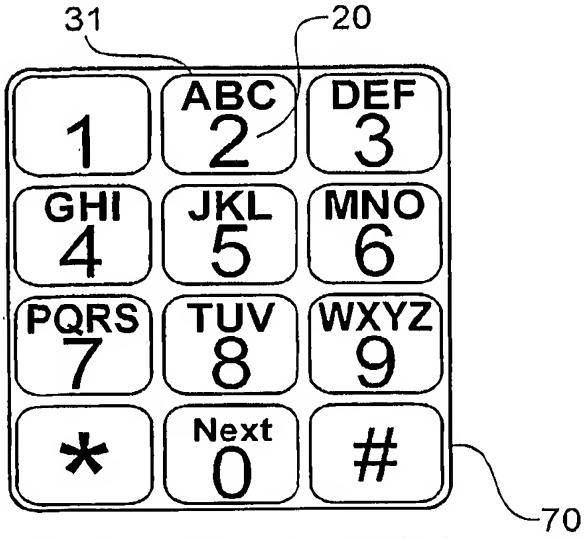
FIG. 7B



note: cellphone command and navigation function buttons can stay the original size during two-way stretch

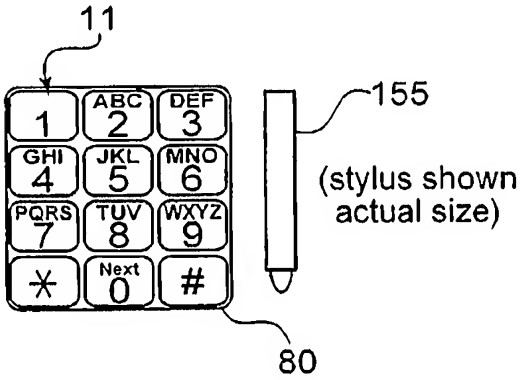
horizontal AND vertical stretch

FIG. 7C



letter layout takes over available space above number, shown here twice actual size

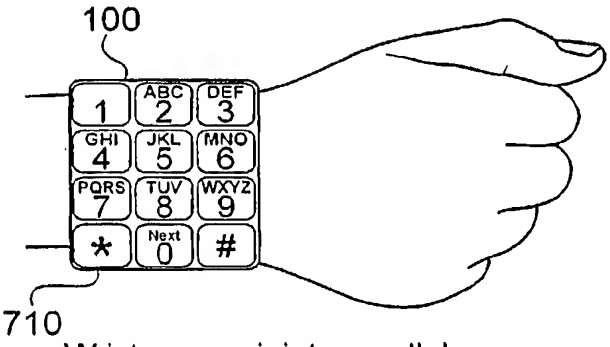
FIG. 8A



(stylus shown actual size)

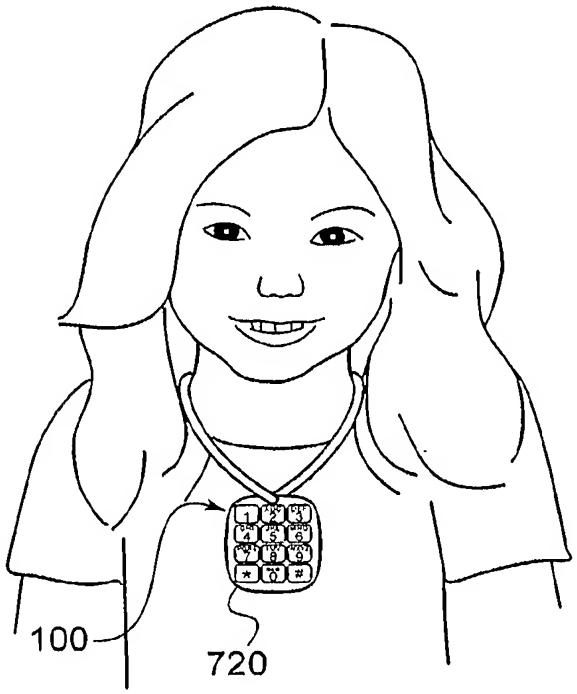
letter layout takes over entire display screen, shown here only slightly larger than actual size

FIG. 8B



Wrist worn miniature cellphone

FIG. 8C



letter layout takes over entire display screen, shown here twice actual size

Miniature cellphone worn as pendant

FIG. 8D

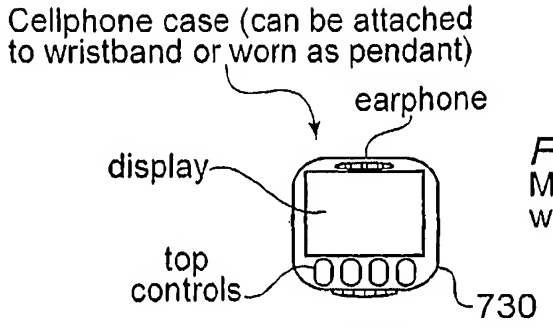


FIG. 9A
Miniature Cell Phone with keyboard stored

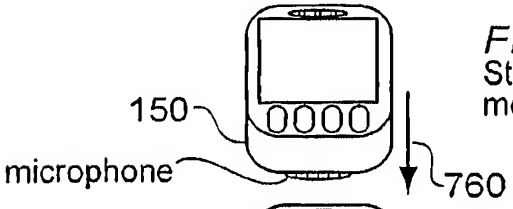


FIG. 9B
Stored keyboard moves downward

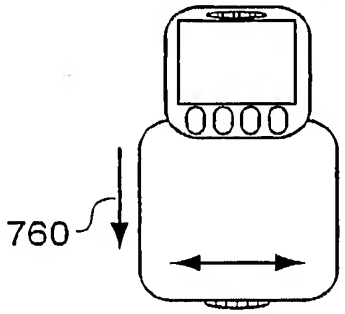


FIG. 9C
Stored keyboard continues to move downward and begins lateral expansion

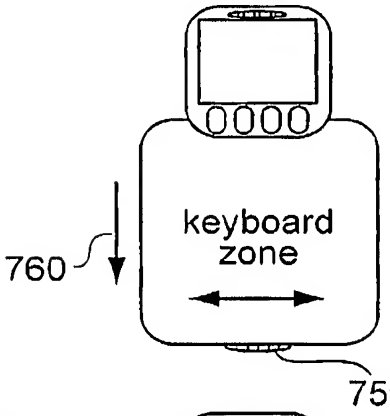


FIG. 9D
Stored keyboard completes its move downward and completes lateral expansion

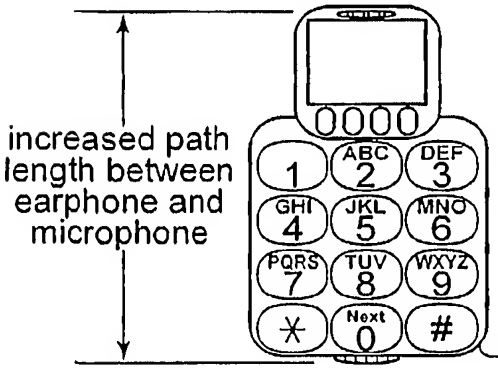


FIG. 9E
Stored keyboard has completed its move downward and completed lateral expansion, and the actual keyboard is shown

FIG. 9
Miniature Cell Phone keyboard deploys out from storage location - rectilinear expansion mode shown

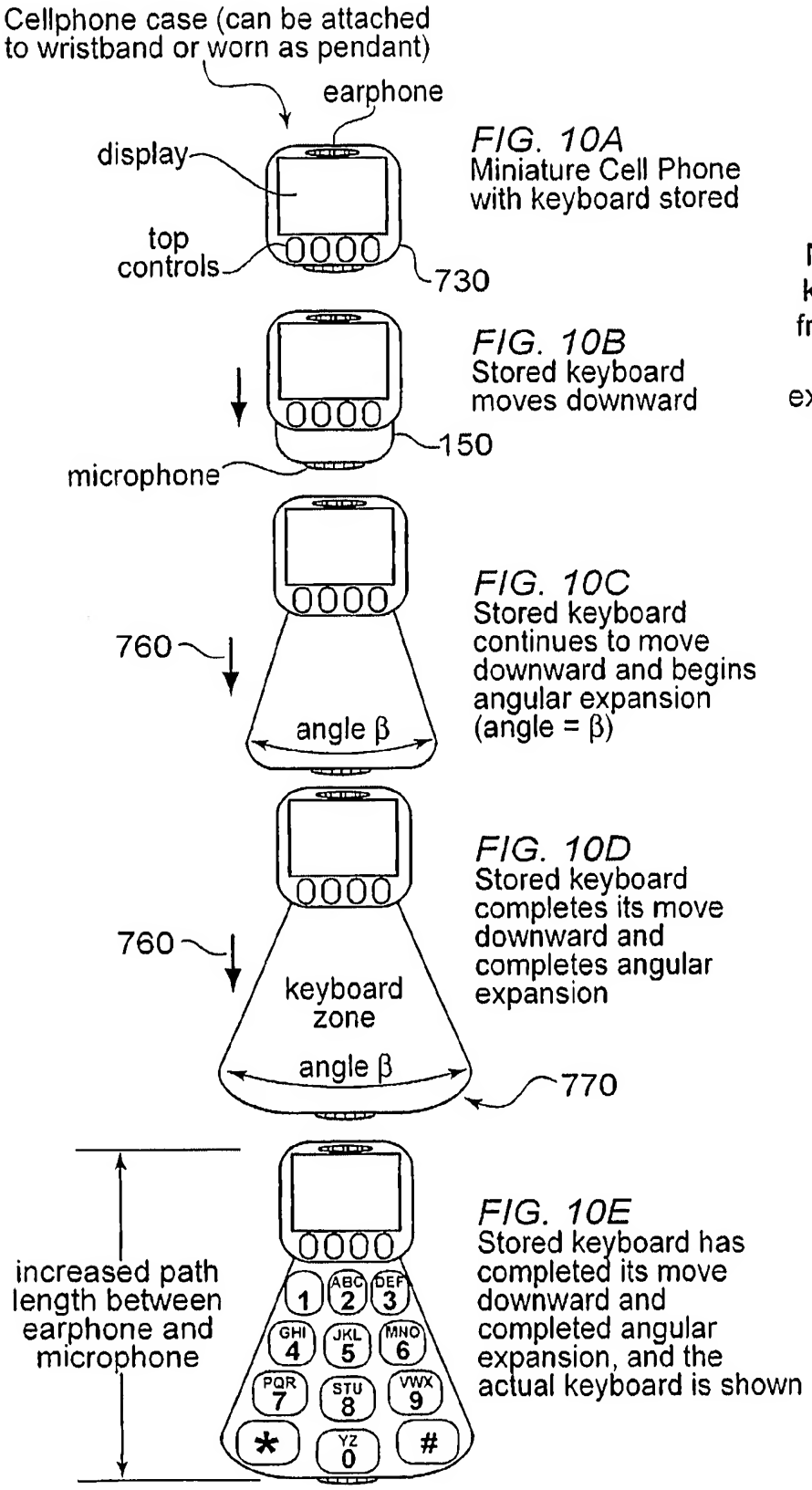


FIG. 10A
Miniature Cell Phone with keyboard stored

FIG. 10B
Stored keyboard moves downward

FIG. 10C
Stored keyboard continues to move downward and begins angular expansion (angle = β)

FIG. 10D
Stored keyboard completes its move downward and completes angular expansion

FIG. 10E
Stored keyboard has completed its move downward and completed angular expansion, and the actual keyboard is shown

FIG. 10
Miniature Cell Phone keyboard deploys out from storage location - linear and angular expansion mode shown